

In the Claims:

Please amend Claims 1, 3, 4, 5, 11, and 23. Please add new Claims 34 through 37.

A complete copy of the claims including marked-up versions of each claim which is amended in this Amendment, appears below.

1035893243 110 4,961,298 OR 4,641,469 F F110 6205729  
(17) (12)

- 1 C 1. (Currently Amended) An insulated wall panel, comprising: 10  
2 a rigid foam sheet with first and second planar sides and first and second 32,34  
3 opposing edges and having first and second grooves extending substantially the full  
4 length of the sheet in a substantially parallel orientation, said first and said second  
5 grooves located only in the first planar side of the sheet ~~and first and second opposing~~  
6 edges with said first and second grooves located generally parallel to the first and second  
7 grooves said first and second opposing edges;  
8 a first reinforcing strip having a length, a top and a bottom with the bottom 19 22 20,26,3  
9 being disposed in the first groove and the top facing outwardly away from the first  
10 groove, wherein the first strip extends substantially the full length of the sheet and  
11 disposed in said sheet inwardly away from the first and second edges of the sheet;  
12 a second reinforcing strip having a length, a top and a bottom with the 19 22 20,26,3  
13 bottom being disposed in the second groove and the top facing outwardly away from the  
14 second groove, wherein the second strip extends substantially the full length of the sheet  
15 and is disposed in said sheet inwardly away from the first and second edges of the sheet;

16 *C1* a first thin reinforcing layer bonded to the first planar side of the sheet, and  
17 extending across the top of the first and second grooves and substantially covering the  
18 entire first planar side of the sheet; and  
19 *do to add - additional* a second thin reinforcing layer bonded to the second planar side of the sheet  
20 and extending across substantially an entire surface of second planar side.

1 *103* 2. (Original) The insulated wall panel of Claim 1, wherein the bottoms of the  
2 first and second strips each have two downwardly extending *24* flanges that are oriented  
3 substantially perpendicular to the first planar side.

1 *103 claim 1 but adds info from claim 2* 3. (Currently Amended) An insulated wall panel, comprising:  
2 *12 16 14* a rigid foam sheet with first and second planar sides and having first and  
3 *140* second grooves extending substantially the full length of the sheet in a substantially  
4 parallel orientation ~~in~~ within only the first side of the sheet;  
5 *18 22 20, 26, 13* a first reinforcing strip having a length, a top and a bottom with the bottom  
6 being disposed in the first groove and the top facing outwardly away from the first  
7 groove, wherein the first strip extends substantially the full length of the sheet;  
8 *18 22 20, 26, 13* a second reinforcing strip having a length, a top and a bottom with the  
9 bottom being disposed in the second groove and the top facing outwardly away from the  
10 second groove, wherein the second strip extends substantially the full length of the sheet;

*C1 cont*

11 a first thin reinforcing layer<sup>52</sup> bonded to the first planar side of the sheet, and  
12 extending across the top of the first and second grooves and substantially covering the  
13 entire first planar side of the sheet; and  
14 a second thin reinforcing layer<sup>56</sup> bonded to the second planar side of the sheet  
15 and extending across substantially an entire surface of second planar side, wherein the  
16 bottoms of the first and second strips each have two downwardly<sup>24</sup> extending flanges that  
17 are oriented substantially perpendicular to the first planar side, and further wherein the  
18 top of the first and second reinforcing strips are mechanically textured over the length of<sup>as 30</sup>  
19 the first and second strips to provide an improved gripping surface for drills and self  
20 tapping screws.<sup>lines 33-34</sup>

*Same as claim 1*

1 4. (Currently Amended) An insulated wall panel, comprising:  
2 a rigid foam sheet with first and second planar sides and having first and  
3 second grooves<sup>12</sup> extending substantially the full length of the sheet in a substantially  
4 parallel orientation ~~in~~ within only the first side of the sheet;  
5 a first reinforcing strip<sup>16</sup> having a length, a top and a bottom with the bottom<sup>14</sup>  
6 being disposed in the first groove and the top facing outwardly away from the first  
7 groove, wherein the first strip extends substantially the full length of the sheet;  
8 a second reinforcing strip<sup>18</sup> having a length, a top and a bottom with the<sup>22 20, 26, B</sup>  
9 bottom being disposed in the second groove and the top facing outwardly away from the  
10 second groove, wherein the second strip extends substantially the full length of the sheet;

December 12, 2003

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11 a first thin reinforcing layer<sup>52</sup> bonded to the first planar side of the sheet, and  
 12 extending across the top of the first and second grooves and substantially covering the  
 13 entire first planar side of the sheet; and  
 14 a second thin reinforcing layer<sup>56</sup> bonded to the second planar side of the sheet  
 15 and extending across substantially an entire surface of second planar side, wherein the  
 16 bottoms of the first and second strips each have two downwardly extending flanges that<sup>24</sup>  
 17 are oriented substantially perpendicular to the first planar side, and further wherein the  
 18 top of the first and second reinforcing strips have a plurality of holes spaced apart at  
 19 predetermined intervals along the length of the first and second reinforcing strips.

Same as 1

1 5. (Currently Amended) An insulated wall panel, comprising:<sup>10</sup>  
 2 a rigid foam sheet with first and second planar sides and having first and<sup>12 16 14</sup>  
 3 second grooves extending substantially the full length of the sheet in a substantially<sup>110</sup>  
 4 parallel orientation ~~in~~ within only the first side of the sheet;  
 5 a first reinforcing strip<sup>13</sup> having a length, a top and a bottom with the bottom<sup>22 2, 26, P</sup>  
 6 being disposed in the first groove<sup>110</sup> and the top facing outwardly away from the first  
 7 groove, wherein the first strip extends substantially the full length of the sheet;  
 8 a second reinforcing strip<sup>same</sup> having a length, a top and a bottom with the  
 9 bottom being disposed in the second groove and the top facing outwardly away from the  
 10 second groove, wherein the second strip extends substantially the full length of the sheet;

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11 a first thin reinforcing layer bonded to the first planar side of the sheet, and

12 extending across the top of the first and second grooves and substantially covering the

13 entire first planar side of the sheet; and

14 a second thin reinforcing layer bonded to the second planar side of the sheet

15 and extending across substantially an entire surface of second planar side, wherein the

16 bottoms of the first and second strips each have two downwardly extending flanges that

17 are oriented substantially perpendicular to the first planar side, and further wherein the

18 top of the first and second reinforcing strips have a plurality of slots spaced apart at

19 predetermined intervals along the length of the first and second reinforcing strips.

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1 6. (Previously Presented) The insulated wall panel of any of Claims 3, 4 or 5,

2 wherein the first reinforcing layer is bonded to the rigid foam sheet to enclose the first

3 and second reinforcing strips and define a first vapor barrier across substantially the

4 entire first side of the sheet.

Same

1 7. (Original) The insulated wall panel of Claim 6, wherein the second

2 reinforcing layer is bonded to the rigid foam sheet to define a second vapor barrier across

3 substantially the entire second side of the sheet.

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8. (Original) The insulated wall panel of Claim 7, wherein the first and

second reinforcing layers have a tensile strength at least 100 times as great as the tensile strength of the foam sheet.

9. (Previously Presented) An insulated wall panel, comprising:

a rigid foam sheet with first and second planar sides and having first and

second grooves extending substantially the full length of the sheet in a substantially parallel orientation in the first side of the sheet;

a first reinforcing strip having a length, a top and a bottom with the bottom

being disposed in the first groove and the top facing outwardly away from the first

groove, wherein the first strip extends substantially the full length of the sheet;

a second reinforcing strip having a length, a top and a bottom with the

bottom being disposed in the second groove and the top facing outwardly away from the

second groove, wherein the second strip extends substantially the full length of the sheet;

a first thin reinforcing layer bonded to the first planar side of the sheet, and

extending across the top of the first and second grooves and substantially covering the entire first planar side of the sheet; and

a second thin reinforcing layer bonded to the second planar side of the sheet

and extending across substantially an entire surface of second planar side, wherein the

bottoms of the first and second strips each have two downwardly extending flanges that

are oriented substantially perpendicular to the first planar side, wherein the first

reinforcing layer is bonded to the rigid foam sheet to enclose the first and second

December 12, 2003

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19 reinforcing strips and define a first vapor barrier across substantially the entire first side  
20 of the sheet, wherein the second reinforcing layer is bonded to the rigid foam sheet to  
21 define a second vapor barrier across substantially the entire second side of the sheet,  
22 wherein the first and second reinforcing layers have a tensile strength at least 100 times  
23 as great as the tensile strength of the foam sheet, and wherein a first portion of the first  
24 reinforcing layer extending across the top of the first reinforcing strip is placed in tension  
25 when the panel is bent away from the first reinforcing strip before the foam sheet will  
26 fracture at the first groove.

1 10. (Previously Presented) An insulated wall panel, comprising:  
2 a rigid foam sheet with first and second planar sides and having first and  
3 second grooves extending substantially the full length of the sheet in a substantially  
4 parallel orientation in the first side of the sheet;  
5 a first reinforcing strip having a length, a top and a bottom with the bottom  
6 being disposed in the first groove and the top facing outwardly away from the first  
7 groove, wherein the first strip extends substantially the full length of the sheet;  
8 a second reinforcing strip having a length, a top and a bottom with the  
9 bottom being disposed in the second groove and the top facing outwardly away from the  
10 second groove, wherein the second strip extends substantially the full length of the sheet;

Cont

11 a first thin reinforcing layer bonded to the first planar side of the sheet, and  
12 extending across the top of the first and second grooves and substantially covering the  
13 entire first planar side of the sheet; and  
14 a second thin reinforcing layer bonded to the second planar side of the sheet  
15 and extending across substantially an entire surface of second planar side, wherein the  
16 bottoms of the first and second strips each have two downwardly extending flanges that  
17 are oriented substantially perpendicular to the first planar side, wherein the first  
18 reinforcing layer is bonded to the rigid foam sheet to enclose the first and second  
19 reinforcing strips and define a first vapor barrier across substantially the entire first side  
20 of the sheet, wherein the second reinforcing layer is bonded to the rigid foam sheet to  
21 define a second vapor barrier across substantially the entire second side of the sheet,  
22 wherein the first and second reinforcing layers have a tensile strength at least 100 times  
23 as great as the tensile strength of the foam sheet, and wherein a second portion of the first  
24 reinforcing layer extending across the top of the second reinforcing strip is placed in  
25 tension when the panel is bent away from the second reinforcing strip before the foam  
26 sheet will fracture at the second groove.

Same as 1

1 11. (Currently Amended) A method of manufacturing an insulated wall panel,  
2 comprising the steps of:  
3 creating a rigid foam block having first, and second opposing sides;



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4 cutting the foam block to form a plurality of stacked individual foam sheets  
5 having first and second sides and a plurality of parallel recesses in only the first side;  
6 inserting a reinforcing strip having a top and a bottom into each of the  
7 plurality of recesses in each of the plurality of sheets, wherein the reinforcing strip has a  
8 surface finish including at least a mechanically textured top surface and a plurality of  
9 spaced apart holes; or a plurality of spaced apart slots, ~~or a combination thereof~~,  
10 configured to engage mechanical fasteners;  
11 covering the tops of each of the reinforcing strips with a first thin  
12 reinforcing layer; and  
13 bonding the first reinforcing layer to the first side of each of the foam  
14 sheets.

1 12. (Original) The method of Claim 11, further comprising the steps of:  
2 bonding a <sup>2nd</sup> second reinforcing layer to the second side of each of the foam  
3 sheets.

1 X 13. (Previously Presented) A method of manufacturing an insulated wall panel,  
2 comprising the steps of:  
3 creating a rigid foam block having first and second opposing sides;  
4 cutting the foam block to form a plurality of stacked individual foam sheets  
5 having first and second sides and a plurality of parallel recesses in the first side;

Claim

6 inserting a reinforcing strip having a top and a bottom into each of the plurality of  
7 recesses in each of the plurality of sheets;  
8 covering the tops of each of the reinforcing strips with a first thin reinforcing  
9 layer;  
10 bonding the first reinforcing layer to the first side of each of the foam sheets; and  
11 bonding a second reinforcing layer to the second side of each of the foam sheets;  
12 wherein the step of cutting the foam block includes the steps of:  
13 ~~/~~ drawing a hotwire frame of substantially equally spaced parallel hot wires  
14 through the block from the first side to the second opposing side of the block;  
15 simultaneously forming each of the plurality of grooves in the block with  
16 each of the hot wires in the of the hotwire frame; and  
17 completing a path through the block by substantially simultaneously  
18 separating the block into the plurality of sheets.

1 14. (Original) The method of Claim 11, wherein the step of bonding the first  
2 reinforcing layer includes at least one of the following steps:  
3 (a) applying adhesive to the first side of each of the plurality of sheets  
4 and subsequently rolling the first reinforcing layer onto the first side;  
5 (b) applying adhesive to the first reinforcing layer and subsequently  
6 rolling the first reinforcing layer onto the first sides of each of the foam sheets; and

*Claim*

7 (c) rolling the first reinforcing layer onto the first sides of the foam  
8 sheets and subsequently heating the first reinforcing layer to form a thermal bond  
9 between the first sides of the foam sheets and the first layer.

1 ~~15.~~ (Original) The method of Claim 11, further comprising the steps of:  
2 orienting the foam sheet with respect to a means for trimming each sheet  
3 such that there is a predetermined distance between the means for trimming and the  
4 reinforcing strips, and trimming an edge of the foam sheet.

1 ~~16.~~ (Original) A method of manufacturing an insulated foam panel, comprising  
2 the steps of:  
3 forming a liquid matrix of expandable foam precursor;  
4 channeling the liquid matrix out through a nozzle;  
5 capturing the liquid matrix between two parallel and advancing thin sheets  
6 of reinforcing material;  
7 inserting a plurality of continuous webs of reinforcing strip between the  
8 two sheets of reinforcing material;  
9 maintaining the sheets in a substantially parallel, spaced-apart orientation as  
10 they advance over a distance sufficient to permit the liquid matrix to expand, fill  
11 substantially an entire void between the two sheets and harden in the form of a  
12 continuously moving ribbon of insulated paneling; and

Cont

13 repeatedly and successively cutting the moving ribbon into a plurality of  
14 individual insulating panels having a cut edge substantially perpendicular to the direction  
15 of advancement.

17.

1 (Original) The method of Claim 16, further comprising the steps of:  
2 unrolling a plurality of ribbons of reinforcing material at substantially the  
3 same linear rate as the first and second sheets advance; and  
4 roll-forming the plurality of unrolled ribbons into the plurality of  
5 continuous webs of reinforcing strip.

18.

1 (Original) The method of Claim 17, further comprising the step of:  
2 continuously trimming lateral opposed edges of the ribbon of insulated  
3 paneling as the ribbon advances and prior to step of repeatedly and successively cutting.

19.

1 (Original) The method of Claim 17, wherein the step of inserting includes  
2 the steps of:  
3 spacing the plurality of continuous webs of reinforcing strips a  
4 predetermined first distance apart.

20.

1 (Original) The method of Claim 17, wherein the steps of maintaining the  
2 sheets includes the step of:

3 *C1 cont* simultaneously maintaining the plurality of continuous webs of reinforcing  
4 strips at the predetermined first distance apart.

1 *See as 1* 21. (Previously Presented) The insulated wall panel of Claim 3, wherein the  
2 [first and second reinforcing strips include a central recessed portion configured to receive  
3 and support the head of a fastener. *30* *3 line 33-35*

1 *See as 1* 22. (Previously Presented) The insulated wall panel of Claim 21, further  
2 comprising a plurality of fasteners coupled to the central recessed portion of both the first  
3 and second reinforcing strips.

1 *See as 1* 23. (Currently Amended) An insulated wall panel, comprising:  
2 a rigid foam sheet with first and second planar sides and having first and  
3 second grooves extending substantially the full length of the sheet in a substantially  
4 parallel orientation in only the first side of the sheet and first and second opposing edges  
5 generally parallel to the first and second grooves;  
6 a first reinforcing strip having a length, a top and a bottom with the bottom  
7 being disposed in the first groove and the top facing outwardly away from the first  
8 groove, wherein the first strip extends substantially the full length of the sheet and  
9 disposed in said sheet inwardly away from the first and second edges of the sheet;

10 *C1 cont* a second reinforcing strip having a length, a top and a bottom with the  
11 bottom being disposed in the second groove and the top facing outwardly away from the  
12 second groove, wherein the second strip extends substantially the full length of the sheet  
13 and is disposed in said sheet inwardly away from the first and second edges of the sheet;  
14 a first thin reinforcing layer bonded to the first planar side of the sheet, and  
15 extending across the top of the first and second grooves and substantially covering the  
16 entire first planar side of the sheet; and  
17 a second thin reinforcing layer bonded to the second planar side of the sheet  
18 and extending across substantially an entire surface of second planar side,  
19 wherein the first and second reinforcing strips include a central recessed  
20 portion configured to receive and support the head of a fastener and two non recessed  
21 portions that flank the recessed portion and extending substantially the entire length of  
22 the respective first and second reinforcing strips.

1 ~~24.~~ (Previously Presented) The insulated wall panel of Claim 23, further  
2 comprising a plurality of headed fasteners having a head that is supported in the recessed  
3 portion and a shank that extends through the recessed portion.

1 ~~25.~~ (Previously Presented) The insulated wall panel of Claim 3 wherein an  
2 outwardly facing surface of the first and second reinforcing strips is configured to guide  
3 the insertion of a fastener therethrough.

*C1 cont. abt to hydro. rougher*  
1 ~~26.~~ (Previously Presented) The insulated wall panel of Claim 25, wherein the  
2 outwardly facing surface is configured with a surface texture that guides the insertion of a  
3 fastener therethrough.

*See no 1 abt to add.*  
1 ~~27.~~ (Previously Presented) The insulated wall panel of Claim 25, wherein the  
2 outwardly facing surface is configured with apertures that guide the insertion of a  
3 fastener therethrough.

*OK as claimed*  
1 ~~28.~~ (Previously Presented) The insulated wall panel of Claim 3, wherein the  
2 rigid foam sheet has a second side opposite the first side that has no reinforcing strips.

*See cl 1*  
1 ~~29.~~ (Previously Presented) The insulated wall panel of Claim 3, wherein lateral  
2 sides of the first and second reinforcing strips are spaced at least 6 inches away from the *edge*  
3 lateral edges of the rigid foam sheet.

*See cl 1*  
1 ~~30.~~ (Previously Presented) The insulated wall panel of Claim 29, wherein the  
2 first and second reinforcing strips are generally spaced 12 inches apart. *edge*

*See cl 1*  
1 ~~31.~~ (Previously Presented) The insulated wall panel of Claim 3, wherein lateral  
2 sides of the first and second reinforcing strips are spaced at least 8 inches away from the  
3 lateral edges of the rigid foam sheet. *edge*

December 12, 2003

C1 Cont. See also

1        ~~32.~~ (Previously Presented) The insulated wall panel of Claim 31, wherein the  
2 first and second reinforcing strips are generally spaced 16 inches apart. *del 17*

1        *See also*  
2        33. (Previously Presented) The insulated wall panel of Claim 3, wherein the  
3 first and second reinforcing layers primarily consist of paper, foil or plastic film. *61 31e 30*

1        *See also*  
2        34. (New) An insulated wall panel comprising:  
3        a rigid foam sheet having first and second planar faces, and top, bottom and  
4        sides edges surrounding said first and second planar faces, each of said first and said  
5        second planar faces having a planar surface and a length and a width dimension;  
6        at least two grooves formed within one of said first and said second planar  
7        faces, each of said groove extending said length of said first or said second planar face  
8        from said top edge to said bottom edge of said rigid foam sheet;  
9        at least two reinforcing strips, each of said reinforcing strips completely  
10       disposed within one of said grooves and extending said length of said first or said second  
11       planar face from said top edge to said bottom edge of said rigid foam sheet;  
12       a first reinforcing layer bonded to said first planar face of said rigid foam  
13       sheet, said first reinforcing layer completely covering said first planar face but not  
      extending beyond said top, said bottom and said side edges of said rigid foam sheet; and



14                    a second reinforcing layer bonded to said second planar face of said rigid  
15 foam sheet, said second reinforcing layer completely covering said second planar face but  
16 not extending beyond said top, said bottom and said side edges of said rigid foam sheet.

*First time small*  
1                    35. (New) The insulated wall panel of Claim 34, wherein each of said  
2 reinforcing strips has only a first portion and a second portion, said first portion recessed  
3 below said planar surface of said first or said second planar face, and said second portion  
4 co-planar with said planar surface of said first or said second planar face. *(2 @ 24) v*

*See add*  
1                    36. (New) The insulated wall panel of Claim 35, wherein each of said first  
2 portions of said reinforcing strips is configured to receive a plurality of fasteners, each of  
3 said fasteners being recessed below said planar surface of said first or said second planar  
4 face. *col 3 lines 34-35*

*See add*  
1                    37. (New) The insulated wall panel of Claim 35, wherein each of said first  
2 portions of said reinforcing strips includes one of a plurality of holes or a plurality of  
3 slots for engaging said plurality of fasteners. *26*

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